HEREDITARY SYPHILIS.

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NEW YORK.

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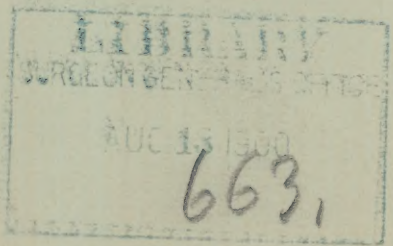

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Pathological Anatomy. When parents (mostly the father) are thoroughly under the influence of syphilis during a successful cohabitation the disease is communicated to the first-formed cells, and through them to all or most organs. The result is death of the embryo or the young fœtus after a very few months. When death takes place before the end of the fourth month of utero-gestation no characteristic tissue changes are found anywhere. They are met with, however, when a fœtus dies about the fifth month or later. One of the most frequent occurrences is enlargement of the spleen. Instead of exhibiting the weight of the healthy spleen, which amounts to 0.33 per cent. of the body-weight, its bulk is increased to 0.76 per cent. It is dense, with a thickened capsule. Its hypertrophy is mostly generalized, sometimes, however, lobular; always hard. Syphilitic endarteritis has also been found.

The syphilitic affection of the placenta may be found on the maternal or on the fœtal side, or on both. The first-named occurrence is rare. It is observed when the woman was infected before conceiving, no matter whether from a healthy or a syphilitic man, or when she was infected during the pregnancy. In these cases the maternal side of the placenta is the seat of interstitial hyperplasia, which begins in the decidua serotina, and while not always extending into the fœtal placenta, is sufficient to destroy the fœtus by induration of the placental tissue and by compression of the bloodvessels. The fœtal placenta, however, is more frequently affected, the changes beginning in the villi and resulting in nodulations which compress the circulation in the maternal placenta.[1]

[1] According to Albert Schwab (Syphilis of the Placenta, Paris, 1896), the placenta has characteristic alterations which, when syphilis is acquired during pregnancy, may be trifling, and, therefore, not injurious. The syphilitic placenta is large, soft, or hard; the normal placenta weighs one-sixth of the weight of the fœtus, the syphilitic placenta at full term one-fourth, and that of the syphilitic fœtus born at the seventh or eighth and a half

Osteochondritis is a constant accompaniment of hereditary syphilis. It begins with the fifth month of utero-gestation. Our principal authority on that subject is still Georg Wegner (Virchow's *Archiv*, 1870). Between the diaphysis and the epiphysis of the fœtal and infant bone there is normally a straight whitish layer one millimetre wide. It is here that the normal calcification of the cartilage takes place. In syphilis this zone is larger; it is dry, not straight, but dentated and hard. (In rhachitis it becomes soft.) It extends in both directions, namely, into the diaphysis and into the epiphysis. There is no vascularization, no swelling. (In rhachitis there are both vascularization and swelling.) In syphilis it is of a sclerotic density. The spaces between the solid tissues are narrow, the organic part of the bone is more or less absent. While lime is being constantly eliminated, no young bone tissue is formed, and calcified cartilage is found in place of durable bone. Thus the spyhilitic bones become fragile, a dry separation of the epiphysis from the diaphysis takes place without deformity. (In rhachitis deformities are the rule, and it is the inorganic part of the bone which is not developed on time.)

The diaphysis of a syphilitic bone, however, is sometimes pultaceous. Even abscesses are formed, but only when the process is of a mixed character. The changes above described are mostly found on the lower epiphysis of the femur and of the fibula and tibia, also on the upper extremities. In all of these places it interferes with the growth of the extremities. The stunted condition of syphilitic children is of frequent observation. On the other hand, there are a few cases of gigantic growth which are also attributed to hereditary syphilis. Other places where similar changes are found are the vertebræ, the pelvis, and the scapula. Recovery is apt to take place when, under the influence of specific treatment, new osteoblasts are formed in the medullary spaces. It has been claimed, mainly by Braunschweig, that isolated particles of carti-

month of utero-gestation, two-sevenths of the weight of the fœtus. There are constant microscopical alterations, a diffuse cirrhosis, both of the maternal and of the fœtal placenta. The villi of the chorion are hypertrophic and show endo-periarteritis and endo-periphlebitis. Thereby many vessels are obstructed. The epithelium of the villi is often destroyed or proliferating; the membrana chorii is often thickened and its vessels changed as above. There are no macrosopic, but sometimes microscopic gummata in the placenta. According to him, hemorrhages, fibro-fatty deposits and white infarctions do not prove the presence of syphilis. In some of these hemorrhages the placental tissues are destroyed and may facilitate a direct communication. That is why in his new edition of 1896 Taylor states that full infection may, in rare cases, occur when the filtrating properties of the placenta have been impaired by morbid changes.

lage remain in the newly formed healthy bones, and may give rise to the formation of enchondroma.

Affections of the labyrinth, with irreparable deafness, and certain malformations of the teeth are frequently found. The temporary teeth do not often suffer from hereditary syphilis, for they develop at a period of fœtal life which, if the infection of the embryo and early fœtus were very pronounced, would terminate in abortion. What has been called Hutchinson's teeth means, as a rule, the permanent teeth. It is mainly the upper central incisors which are affected. They develop in their alveoli between the seventh fœtal and third infant months. The whole substance of the tooth is affected. They are small, dwarfed, notched on their cutting-edges, separated from each other, turned around their axis, divergent, and have a deformed crown.

The liver is large. The enlargement is more diffuse than localized. The tissue is either dark and hyperæmic, or of lighter color, with interspersed small yellowish spots, and of solid cirrhotic condition, with heavy, obtuse edges. The yellowish spots are of different sizes, from that of a miliary tubercle upward. Cicatricial lobulation is frequent. When such changes occur near the portal vein cirrhosis of the liver will follow ; when around and in the biliary ducts, with or without the duct of Arantius, jaundice. The microscopic appearance in all of these deposits, like that in other organs, is that of a round-cell infiltration, besides proliferation and induration of the interstitial tissue. In infants born alive with syphilis, particularly those who survive after a successful specific treatment, the liver is not always swollen. Hochsinger found in 148 cases of such hereditary syphilis 46 times enlargement of the liver and of the spleen, without any icterus or ascites, and without syphilitic endarteritis in his five autopsies. On the other hand, Neumann found syphilis of the liver without alteration of volume. The case of cirrhotic atrophy of the liver demonstrated by me before the children's section of the American Medical Association at Richmond, in 1880, was probably of syphilitic origin, and as such very rare. Bernhardt found parenchymatous changes only, and but indistinct traces of interstitial alteration ; Chiari no hypertrophy of the liver and no affection of the portal vein and hepatic arteries, but enough hyperplastic infiltration in and about the biliary ducts to cause jaundice. It is evident, therefore, that not in every case should we expect uniform

results, but it is certain that the characteristic changes of the liver, hypertrophy included, are the more frequent the earlier and the more intense the ravages of syphilis have proved to be.

The pancreas is sometimes found large, with diffuse, solid, whitish deposits of interstitial tissue.

The kidneys are not frequently affected. The changes met with in them are of three kinds: interstitial hyperplasia, gummatous infiltration with round-cells, and endarteritis. That nephritis may be the consequence of hereditary syphilis is claimed by H. A. Robins, who quotes Barthelemy and Hock (*Virginia Medical Monthly*, May, 1895).

The accessory kidneys were once found large by Baerensprung. They contained miliary gummata.

The testes are liable to be large, dense, sclerotic. In the newly born interstitial tissue hyperplasia is more frequent; in older children, gummatous degeneration.

The digestive tract in hereditary syphilis is not liable to exhibit many changes. In rare cases in the stomach and intestines infiltration or ulcerations were found in the mucous membranes or in the muscular layers.

The lungs are diseased in early and intense infection. In those dead or dying in or after a birth premature by four or six weeks, the lungs were large, solid, yellowish (the so-called white pneumonia), sometimes with interspersed softening or nodes. These processes are usually interstitial, the alveoli narrowed by compression.

The bronchial glands are enlarged, gray or yellow. Other lymph bodies are not frequently affected. They are rather soft and small.

The thyroid was found by Demme to contain gummata in retarded syphilis.

The thymus gland is affected by hereditary syphilis more frequently than is generally assumed to be the case. However, since I wrote my contributions to the "Anatomy and Pathology of the Thymus Gland," in the *Transactions* of the Association of American Physicians, 1888, for which Henry Koplik did the highly meritorious anatomical and microscopic work, very little has been added. The bloodvessels were very much changed; indeed, no single coat was affected, but a general thickening took place. In some instances the vessel was simply replaced by a ball of connective tissue. Thus alterations in the vessels looked like those of

hepatic or renal interstitial inflammations. Such interstitial hyperplasia would be found in the thymuses of syphilitic infants whether the glands were large or small. Besides, abscesses were found by Dubois, by Haugsted, in two young men with persistent thymuses, and by Mewis, and hemorrhages by Fuerth, F. Weber, and others.

The heart is rarely affected. Still, two changes have been met with, namely, fibrous myocarditis and gummata, both in the newly born. The small arteries showed endarteritis. Kantzow and Virchow have the case of an eight-month fœtus, stillborn, with a myoma at the base of the heart and miliary gummata on the right ventricle near the cone of the pulmonary artery, together with white hepatization of the lungs and hemorrhagic pleurisy. Hutchinson has the case of a child of one year with syphilitic myocarditis and ecchymoses of both ventricles, and ulcerations on the thighs. The infant died suddenly in orthopnœa. Wendt observed a stillborn infant with fibrous myocarditis of the right ventricle, gummatous endocarditis of the tricuspid and of the pulmonary valves, and stenosis of the latter; Morgan an infant who died at the age of a few months with a gumma of the anterior surface of the heart and a gumma of the liver.

In the pericardium miliary syphilomata were found, with obliterating adhesions.

The pathological anatomy of the nervous system in hereditary syphilis is but little known. The so-called encephalitis of the newly born, which was made so much of a decade ago, has been proved by Jastrowitz to be no encephalitis, and not syphilitic. Hemorrhagic pachymeningitis is rare. Internal hydrocephalus has often been observed in hereditary syphilis, but endarteritis has been proved in but few instances, and gummata still less. Rosa Engelmann published a case of cerebral syphilis in a ten-months-old child, in *Medicin*, November, 1893. Rumpf has but two cases. Starr declares it to be quite rare, and cerebral gummata are very scarce, according to him, below the twelfth year of life.

In his last researches on spinal localization of hereditary syphilis, published in *Nouvelle Iconographie de la Salpêtrière*, 1896, G. Gasne arrives at the following conclusions: That the meningo-medullary changes in the fœtus, infant, and adult are identical; that the ganglia are infiltrated, with the nerve-cells mostly normal. There is a fibrous thickening or infiltration, with embryonic cells

and by connective tissue, particularly of the septa and blood-vessels. These infiltrations are sometimes of a gummatous, round-cell character. That process is disseminated, mostly, however, posterior both in medulla and meninges. But, indeed, no part was found absolutely normal.

Symptomatology. The syphilitic fœtus is of more anæmic, ashy appearance and of less weight than the healthy one of equal age. When it dies its macerated tissues are speedily imbibed with blood. When death occurs in early months no pathological changes of a specific character can be made out. When it is prematurely born and alive it almost always dies soon. When it is born at full term, but thoroughly syphilitic, it is generally dead when born, or exhibits some unmistakable symptoms. The soles of the feet and the palms of the hands, either at birth or within a week, are covered with pemphigus bullæ, with a very shallow if any hyperæmic edge. They are quite numerous, mostly solitary, sometimes confluent; rarely ulcerous at first. Besides a moderate coryza, there is no visible symptom of syphilis except the universal feebleness. Atrophy is not met with in every case. The voice is pitiably thin. Most of these cases will die; many will live if the treatment is as active as it should be gentle.

In most cases of hereditary syphilis, however, the infant is born apparently healthy. Mostly between the fourth and seventh weeks the nasal respiration becomes impeded and noisy, with or without a nasal discharge. Dry crusts are more common. The nostrils are dry; there are rhagades. In but rare instances the bones or cartilages of the nose are affected. In that case a saddle-nose, like that of tertiary syphilis in adults, may be the result.

Soon after the skin shows eruptions in all varieties of exudation, infiltration, and pigmentation. Sometimes the nail and its matrix participate in the process. Sometimes there is fever. The skin becomes dry, there are rhagades of lips, nose, ears, eyelids, mouth, and anus. Three stages of the eruptive process may be distinguished—that of hyperæmia, of extra-vascular infiltration, and of thickening of the epidermis.

The forms of cutaneous eruption at this stage are roseola, with or without the changes alluded to before, reddish, copper-colored, its outlines mostly resembling measles. This macula becomes a papula by exudation and infiltration, which need not be general but occupies the centre of the macula only. The epidermis be-

comes very thin and shining, of an indefinite yellowish color. The macula may also become a squama through the process of a dry desquamation. In the centre of the papula, which often changes into a vesicle, a depression is liable to take place, or the vesicle is transformed into a pustule, or, when the process of granulation and pus-formation is very vigorous, into a rupia. In the neighborhood of secreting surfaces the infiltration of the tissues and the constant presence of mucus cause the removal of the epidermis and the production of condylomata, for instance, near and in the mouth, ear, eye, and nates. The fingers, mainly the last phalanges, are red, infiltrated and peeling; the nails exhibit papular infiltration, vesicles or pustules about the matrix (paronychia syphilitica), condylomata and hemorrhages. The bones of the phalanges will swell, their medullary canal is changed into a large cavity, the bones become thin and necrotic ("dactylitis"). Intertrigo is common. It differs in this from the common form, that real infiltration of the surface and a turbid yellow color are more frequent.

The mucous membranes suffer at an early time from every form of catarrh to ulceration; the nose, lips, cheeks, gums, also the transition-membranes, are mostly affected—the soft palate not so often as in acquired syphilis. The conjunctivæ are frequently catarrhal. The cornea is liable to be infiltrated or destroyed. Iritis, retinitis, and turbidity of the corpus vitreum must be looked for. The lashes and brows fall out. The rectum, which is sometimes prolapsed, is ulcerated or condylomatous. The lymph-nodes (rarely the cubital) are swollen. Anæmia is marked, and the spleen is mostly felt enlarged.

Recovery, however, is apt to take place under proper treatment, but relapses are frequent.

Visceral syphilis need not be general or intense, but it may persist into infancy and childhood. The liver is mostly affected. It is large and hard. Sometimes there is ascites. Jaundice is occasionally seen. It appears mostly a few weeks after birth, and may thus be diagnosticated from the common jaundice of the newly born. The absolutely bad prognosis of Heubner is not borne out by my experience. Two cases I remember distinctly; both children are now alive and in fair health. The spleen may often be felt under the ribs.

Syphilitic osteochondritis is often unaccompanied with serious symptoms, and therefore is liable not to be diagnosticated in the

beginning. There may be no or very little swelling. The joints are not affected. In many the bones feel slightly swollen. When the swelling is more pronounced it is conical and painful. Sometimes the skin is reddened. Finally, the separation of epiphysis and diaphysis may take place, and crepitation is observed with less pain than might be expected. This condition is found mostly on the humerus. In that case the arm is useless and pronated. This condition has been described by Parrot, no matter whether separation was complete or not, as pseudo-paralysis, and goes by his name. The excellent author deserved a better fate. Not only is his name connected with a pseudo-paralysis which is neither "pseudo" nor "paralysis," but imitators have since spoken of a pseudo-paralysis in rhachitis. Next time we shall hear of a pseudo-paralysis in a genuine fracture of the thigh, in sprain of the ankle, or in lumbago.

That intestinal syphilis persists into later life has not been demonstrated. Cases of early diarrhœa may terminate fatally. Under the heading "Atrophia lævis baseos linguæ" there is a paper by Lewin and Heller, in Virchow's *Archiv*, vol. cxxxviii. They describe a smooth atrophy of the base of the tongue which is claimed to be characteristic of hereditary syphilis. They also refer, quoting Robinson, of London, Fournier and Hyde, of Chicago, to the existence of linear, radiated cicatrices around the mouth from the same cause.

Hemorrhages caused by hereditary syphilis, are mostly punctated, petechial; they are found on the skin, in the muscles, in serous and mucous membranes, in the glands, such as thymus and thyroid; on the pleura and pericardium, with or without numerous blood-points in the lungs. I have often seen them either immediately after birth or within a few weeks. In a few cases they were subperiosteal, on the humerus, sometimes large but isolated, and not connected with scurvy. One of the first to point out the syphilitic character of these petechiæ was J. Lewis Smith, in 1855. The usual lesion found is endarteritis. Mracek found also cells containing fat on, and dilatation of, capillaries, and a nuclear proliferation on the vasa vasorum. Finkelstein reports the presence of a bacillus hemorrhagicus, like Kolb, who found it in morbus maculosus (Werlhof). Still, it ought to be mentioned that septic microbes are often found in syphilitic infants without hemorrhages, even in the fœtus; and, besides, not every such hemorrhage ought

to be taken as a positive proof of syphilis. Septic infection of any kind in a vulnerable body may have the same effect. Neumann once found bacillus pyocyaneus, once staphylococcus pyogenes aureus, once streptococcus. Whether Winckel's disease, the so-called "cyanotic icterus cum hæmoglobinuria," is now and then of syphilitic origin remains to be seen. In it streptococci, bacillus enteritidis, and bacterium coli commune have been noticed.

Such hemorrhages do not occur in prematurely stillborn or dying infants solely, as Buhl claimed. He observed them himself in children in whom syphilis appeared after birth. Max Stoos reports the case of a female child of three months of a syphilitic father. At that age moist spots appeared on face, hands, and soles; around the nates the skin was red. In a few hours the nates, genitals, hands, feet, lips, and nails were blue with hemorrhages, and on the same day there came blood from the stomach and anus. The loss of blood was accompanied by a sunken fontanelle and a temperature of 35.2° C. The treatment consisted of calomel, warmth to the body, and iced milk. The patient recovered.

Appropriate treatment is very apt to procure more or less complete recovery of many syphilitic infants who enjoy good care and proper feeding. If the prognosis be declared to be absolutely unfavorable in all those cases of such infants brought up on artificial food, the fault is to be found with the selection of an improper one. Still, it must be said that the prognosis is doubtful even under favorable circumstances. The object to be accomplished is not only the saving of life, but the procuring of permanent health. This is no easy task even in reference to those who never exhibit any structural syphilitic symptoms, but suffer from such low vitality that even sudden deaths are not very rare. In such babies we notice anæmia, debility, low weight, and retarded development. When in later years, in children of six or eight years, we meet low weight, muscular debility, defective general development, without a tangible cause, it is worth while to remember that this condition may date from the influence worked by extinct paternal syphilis. There is also moderate swelling of lymph-nodes and a large size of spleen and still more of the liver. The blood-cells are less in number. Like those in rhachitis, they are apt to be nucleated. There are more, and perinuclear leucocytes and myeloplaques are frequent. Bronchitis and pneu-

monia are often met with; eclampsia and chronic hydrocephalus are not infrequent occurrences.

In spite of treatment and apparent recovery, however, syphilis may undergo further development and reappear after some time in the shape of relapses, but the nature of its symptoms will change. In place of an almost exclusively interstitial process, gummata and syphilomata will be observed, and on the mucous membranes there is more tendency to ulceration. The same disposition is met with on the fingers and toes, on cranium, lips, tongue, tonsils, eyelids, ears, skin, and anus. The long bones will exhibit some periostitis, and now and then dry caries. But it is principally the cranial and facial bones and the sternum which are affected. The testicles become gummatous, and show now and then complication with caseous degeneration. The liver furnishes a complication of syphiloma and interstitial hyperplasia; so do the skin and subcutaneous tissue. The nervous system, so rarely affected in the fœtus, exhibits endarteritis, with or without gummatous infiltration. Thus, nervous symptoms are by no means uncommon. Sometimes epilepsy, imbecility, or idiocy, debility, or convulsions, or contractures are the first, sometimes the only, symptoms of reawakened hereditary syphilis. Atrophy of the optic nerve and blindness, which are very exceptional occurrences among adults, appear at an early time. As early as 1868 Mendel drew attention to the influence of hereditary syphilis in the causation of mental diseases, and again, in 1896, he furnished valuable material in the same direction. In progressive paralysis hereditary syphilis is no uncommon factor, although it generally does not appear before the first decade of life. Mendel has the case of a girl who, after having had her first cutaneous eruption at the age of seven months, died when eighteen years old. Wigglesworth collected (*British Medical Journal*, March 25, 1893) eight cases, with an average at the time of death of fourteen years. Middlemass, in the *Journal of Medical Sciences*, January, 1894, published five cases of his own, in four of which hereditary syphilis could be made out distinctly. Thus it becomes apparent what Virchow stated in *Morbid Tumors*, vol. ii. p. 447, that cerebral syphilis is as manifold as that of the skin, and that the lesions are sometimes very apparent; sometimes, however, difficult to find without the most painstaking histological examination.

Complications of hereditary syphilis with other diseases, forming

what has been termed mixed infections, are caused in two different ways: Either the power of resistance on the part of the patient is diminished by the disease, no matter whether fully developed or not. In that way the above diseases are fully explained. Or the vulnerability of the tissues permits the invasion of known or unknown microbes. Through the medium of abrasion of pemphigus or of other eruptions septic infection and furunculosis are not uncommon. Affections of the nose and ear give rise to meningitis. In a similar way pyothorax, purulent peritonitis, articular and periarticular abscesses, also tuberculosis, find their ready explanation. The latter has been made the subject of special research by C. Hochsinger (*Trans. Fourth German Dermat. Congress*). Complications of syphilis and tuberculosis are found at a very early age when syphilis is inherited from the father and tuberculosis from the mother. Caseous conglomerates are often claimed for both affections. When found, however, in hereditary syphilis they ought to be considered syphilomata only when no tubercle bacilli can be discovered. But it is noteworthy that there is great histological resemblance between gummatous and tuberculous products. Both contain giant-cells, and tubercle bacilli are also stained according to the method of Lustgarten and Giacomi. As far as the pneumonia of hereditary syphilis is concerned, it ought to be diagnosticated only when there is vasculitis and interstitial granulation; the so-called pneumonia alba of hereditary syphilis and caseous degeneration are by no means identical. When genuine caseous infiltration is found in hereditar syphilis we have to deal with a mixed infection. (Heubner.)

Etiology. The contagium of syphilis is not known. Its transmissibility through generations and the uniformity of its effect prove its organic character. Its virus is located in the pus of the chancre, in the secretion of condylomata, or in the blood of secondary syphilis. Therefore it is either attached to the cells or suspended in the blood or lymph of the patient, or in both. In an adult its transmission takes place through inoculation on sore surfaces only.

The fœtus or infant becomes syphilitic from the father (paternal infection), or from the mother (ovular infection), or from both.

1. *From the Father.* The syphilitic virus is in the spermatozoon which combines with the healthy ovum. In that case the woman may remain uninfected. Still, that occurrence is rare. In some

of these cases the mothers remain well until they become diseased through kissing or nursing their syphilitic babies, or through a primary chancre contracted about the end of their pregnancy. In a very few instances it has also been observed that a woman who had syphilitic children with syphilitic men had a healthy child afterward from a healthy man.

2. *From the Mother.* The syphilitic virus is in the ovule which combines with the healthy spermatozoon. Besides, the embryo or fœtus may be infected by syphilis contracted by the mother during pregnancy. Or it is even possible that the ovule not infected by a former syphilis may become infected through the circulating blood. Syphilis is not necessarily ubiquitous in the body, and may affect one or another of the organs or tissues. All this is in opposition to those who deny the possibility of the infection of the fœtus through the placenta.

When both parents were syphilitic, or when the woman was infected during or about conception, abortion will take place in the early part of pregnancy.

When in one or both the syphilis was less pronounced, no matter whether treated or not, the fœtus will be carried longer, will be born premature, with morbid changes in skin and viscera, and die soon; or it may be born on time, with symptoms of syphilis, and either die soon or not, according to the amount of virus in circulation.

When the virus is still less poisonous, the fœtus may be born on term, and after having lived a few weeks may develop symptoms of syphilis. It may even happen that the first symptoms become manifest in later years, according to Kassowitz by the fourteenth, Fournier the twenty-fifth, Henoch the twentieth, Robert J. Lee the thirtieth, or later.

All these conditions may be experienced in the same family. From year to year the virulence of the syphilitic infection may decrease either through treatment or spontaneously, and pregnancies following each other may result consecutively in abortion, in premature birth, in birth on time with immediate syphilis, in birth on time with syphilis showing its first symptoms after weeks or after months, or perhaps even after years, or in the birth of a healthy baby who remains healthy, or in the birth of a healthy baby that may never be genuinely syphilitic, but exhibit gradually some constitutional disorder—the para-syphilitic symptoms of Fournier.

This diminution in the influence of the virus is slow in some, more rapid in others. It need not, however, be gradual or regularly progressive. On the contrary, it is a fact that in families so affected, healthy babies are succeeded by diseased or dead ones.

Why should that happen? The explanation of this interesting fact lies in the inequality in the infection of different tissues or organs of the parent or parents, for the power of resistance of certain cell-conglomerates is an element of importance in our calculations. Some organs may be comparatively intact and still infect (through the poisoning influence of the circulating virus) at some later period. This appears established. Thus the testes or the ovaries may be intact at one time, and a healthy baby be produced, and diseased at a later period. Or one of them only may be diseased, or isolated parts of one, or cells, and the result, whether a thoroughly diseased baby or one mildly so, or a constitutionally infirm or a healthy baby, may depend on the mere accident of the presence of a healthy or tainted spermatozoon or ovule.

Few mothers appear to be infected from their embryo, or fœtus, or child. This observation was first made by Baumès and by Colles. By the latter's name this law is known among us. It has been confirmed by Ricord, Diday, Fournier, and others. Certainly it can be more easily understood, and particularly in the line of recent bacteriological knowledge, that there should be, or may be, a great difference between the microbic virus which infects directly, and its toxin which may cause immunity for the mother (and possibly for the child, which may become not syphilitic, but constitutionally infirm).

For it is a fact that healthy mothers do not share in many instances the manifest syphilis of their offspring, who, while unable to infect their mothers, may at any time injure an attendant or wet-nurse. In this way a woman may have healthy children from healthy men, syphilitic children from syphilitic men, in alternation. This very fact of possible infection of a succeeding baby after a healthy one, and the observation of cases in which mothers were undoubtedly made syphilitic by their syphilitic fœtuses, render immunization very questionable as to its power or durability. Altogether, our power to immunize by the toxins of microbes leaves as yet much to be desired. A certain amount of preventive effect may exist in healthy babies born of syphilitic parents, and if Fournier contends that such a child cannot be infected by its

syphilitic mother, he is borne out by some of our experience. But we ought not to forget the difference in this respect between the syphilis contracted during conception and that acquired from a mother who became syphilitic during pregnancy. This syphilis may be and frequently is transmitted to the baby during birth and later. There are even a few cases of hereditary syphilis which were not protected against a new infection. Nature is not so positive and categorical and imperative as not to permit of modifications and exceptions.

The communication of syphilis to the offspring from a mother who became syphilitic during pregnancy is, however, rare, for the corpuscular virus of syphilis does not, like that of anthrax or tuberculosis, easily penetrate the walls of bloodvessels. But when the maternal and fœtal side of the placenta become diseased at the same time, the infant may become syphilitic. In the immunity of mothers Fournier does not believe, but he proclaims an indefinite period of latency. A man with latent syphilis infects the embryo, this the mother. She becomes secondarily syphilitic, directly from the child, without a bubo; after that no more infection can take place from her offspring.

According to Fournier, when both parents were syphilitic the mortality of the offspring was 68.5 per cent.; when the mother, 60 per cent; when the father, 28 per cent. When there were acute symptoms in the parents during the year preceding conception, the cases were grave. Even the absence of syphilitic symptoms during three years before conception yields only a doubtful protection, which becomes more certain when the father (mother) is treated successfully during that period.

The transmissibility to the fœtus of syphilis acquired by the mother during her pregnancy has been lately (*Boston Medical and Surgical Journal*, 1896) discussed by Abner Post. According to him, the difficulty of diagnosis is confused by three other possibilities besides this transmission of acquired syphilis, namely, the syphilis of the infant may have been inherited from the syphilitic father before the mother contracted her syphilis; or the mother may have been syphilitic before the symptoms of alleged acquired syphilis showed themselves; or the infant may contract its syphilis during birth. He decides, however, in favor of the transmission as above stated, led by a few cases sufficiently well authenticated. Indeed, variola and malaria are thus transmitted. The

microbes of anthrax, glanders, pneumonia, typhoid, tuberculosis, and coli commune pass the placenta. Cannot the unknown bacillus of syphilis do the same? It is true that there is no direct communication between the maternal and the fœtal side of the placenta, but there are exceptions, and, as stated above, many of them. The intrauterine infection of syphilis is too well known to be denied, though the explanation may appear insufficient.

Retarded Syphilis. (*Syphilis Tarda.*) The appearance of tertiary symptoms of syphilis is sometimes retarded until the fifth, tenth, twentieth, or even thirtieth year of life. There is no unanimity, however, as to their origin. Some assert their appearance at that late period in cases where no syphilitic symptoms ever existed before. Others take them for the reappearance of syphilis after it has been observed and treated in infancy. Both the long latency and the long intermission are hard to understand unless by assuming that the virus was communicated to or stored away in a single organ or a few organs which were not, or need not, be in very active communication with the rest of the body (bones or capsulated lymph-bodies). In connection with this fact it is noteworthy that the limitation of syphilis to certain organs is quite frequently a peculiarity of this retarded form, which will certainly in many instances appear even when the children were under specific treatment up to an advanced age (Kassowitz). In 40 per cent. of such cases Fournier and Hochsinger found bone diseases, either as ostitis or periostitis. The hyperplastic form of the latter causes hard, not very painful, and sloping swellings, mostly on tibia, humerus, or forearm. The gummatous variety on tibia, sternum, or head is softer. It may terminate in an occasional spontaneous recovery or in permanent depressions, or in tophi, or in ulcerations. When it extends to bones it causes loss of substance (Virchow's "dry caries"), with destruction of bone or atrophy of cartilage. The gummatous form of osteomyelitis is mostly seen in the epiphyses during the advanced period of childhood.

The joints are often the seat of "rheumatic," "rheumatoid" pain. Occasionally "growing pains" are of that character. Chronic synovitis (white swelling), when bilateral, is apt to be syphilitic; when unilateral, tuberculous. In rare instances it assumes the character of arthritis deformans.

The skin, mainly of the face and the calves, exhibits gummata

or hard nodulations of pinhead or pea-size, of dark brown color (lupus is bright red). Originating in the cutis, they reach the surface, where they form crusts or ulcerations, in circular or semicircular shape.

The mucous membrane of the nose is merely catarrhal or thickened at first. It is covered with crusts or excoriations in the interior or on the alæ. Respiration becomes difficult and snoring. Nodulations and ulcerations make their appearance, with ozæna. The latter may accompany the hyperplastic, atrophic, or the ulcerous form of rhinitis. Loss of substance follows the ulceration, perforation takes place in the septum, the ethmoid bone and the superior maxilla, until finally the osseous foundation gives way and the nose sinks in.

The pharynx and palate are affected similarly. The first change is of a catarrhal nature. A dark erythematous redness is observed first, with or without condylomatous patches. Gummatous infiltration and nodulation, adhesions between soft palate and posterior wall of pharynx, or between tongue and pharynx, and perforation of the palate, mostly in its median line, will follow.

The tongue exhibits gummata, undermined ulcerations, and radiated cicatrices, and the epiglottis multiple polypoid hyperplasias.

The changes in the larynx look innocent enough at first, when catarrh and erythematous redness alone are discovered. The malignant character is often developed quite rapidly, with the appearances of cicatrices, gummatous infiltration, ulceration and tumors. In all such cases the prognosis is worse than in those of acquired syphilis.

In the sexual organs Fournier found gummata in rare instances. In the muscles they have been mistaken, as also in acquired syphilis, for sarcoma.

The lymph-nodes are not frequently large, but they are swollen in most cases about the neck, in the axilla, and in the groins. Heubner found the cubital glands also enlarged. Usually these swellings are painless.

The eyes suffer in advanced childhood, mostly about the tenth or twelfth year, from a peculiar form of interstitial keratitis. It exhibits local or universal turbidity, a milk-glass color, with nodular or general vascularization, brownish or whitish (leucoma). The latter form is mostly incurable. The other variety may recover. This keratitis, however, is not always syphilitic. Some

authors attribute 35, others 80 per cent. of this retarded form to syphilis. Retinitis is often found with it (Hirschberg). Iritis is not a tertiary but a secondary symptom of syphilis only.

A painless otitis media has been observed by Fournier. Labyrinthine (nervous) deafness may, if noises and dizziness appear first, occur about puberty. It is incurable.

In connection with keratitis and deafness there is a peculiarity of the two inner permanent incisors. These three anomalies Fournier named the "Hutchinson trias." These incisors are small, low, narrow, notched, distant from each other and the other teeth, and turned round their axes. The lower incisors and the canines will sometimes participate in this morbid condition, which is caused by the fact that they are all formed in their alveolar sacs in the first few months of life, at a time when the temporary teeth have already been supplied with their dentine.

The liver and spleen are often found enlarged, hard, nodulated. This process is interstitial, and may result in cicatricial induration. Amyloid degeneration is also found. Ascites is rare. Jaundice has not been observed. These changes are not often noticed before the tenth year.

The kidneys are but rarely found with interstitial or amyloid changes.

The alterations of the nervous system are probably identical with those of acquired syphilis. Headaches, tinnitus, dizziness, alteration of temperament, idiocy, epilepsy, sometimes hemiplegia (this may be the result of an epileptic attack) have been found. Fournier observed myelitis, tabes, and multiple sclerosis.

There is no positive experience with regard to the sexual organs. If the ova or testes, with their spermatozoa, were affected, transmission to the third generation would be possible. Hitherto it has been denied.

Diagnosis. When abortion takes place before the fifth month no diagnosis of syphilis can be made. When near the normal end of utero-gestation there is an epiphyseal osteo-chondritis, mainly of the lower extremities. The spleen exhibits mostly gummatous tumors, with cicatricial tissue and adherent peritonitis. When the fœtus lives nearly up to the close of utero-gestation the anatomical proofs of syphilis increase in number. When born at full term the infant may exhibit pemphigus of the palm of the hand or of the sole of the foot, also visceral changes. Those less thoroughly

poisoned show a pale red or brown exanthem on face, hands, feet, and genitals, also coryza, also the rhagades of the lips and at anus, described above, and often swollen spleen. The coryza may be dry, the exanthem absent, and there are only a grayish, yellowish discoloration and squamous condition of the surface. All these syphilides may be complicated with an innocent intertrigo. The latter is so common, with or without furunculosis, that particular care should be taken not to mistake it for syphilis. When the infants live to the second or fourth year, condylomata may point equally to hereditary or to acquired syphilis. Small, thin cicatrices on the nose mean mostly heredity. After the second dentition Hutchinson's teeth are mostly, not always, met with. Anæmia is profound, the complexion yellowish. In retarded syphilis the testes may remain small, with no or little hair on pubes. The mammæ are small or quite infantile; the nose small and deformed. There are cicatrices on the lips, the hair is thick and dry and misshapen. Excessive mortality amongst the children of a family is suspicious.

Prognosis. The great mortality of infants suffering from actual or modified symptoms or consequences of syphilis makes the prognosis very doubtful. Mild cases, and infants at the breast, have a better chance than others. In crowded public institutions they die, as most other babies do, though ever so well and healthy on admission. The retarded form, with bone affections solely, are promising; with affections of the skin and modulations of the mucous membranes, less so. Keratitis is pretty bad; deafness still worse; tumefaction of the liver and spleen is obstinate; many nervous derangements are remedial when taken in time. Relapses are frequent.

Prevention. The prevention of hereditary syphilis is based in part on that of syphilis in general. Public hygiene is not benefited, as they try to do in New York, under the guidance of a combination of ignorance and hypocrisy, by disseminating venereal diseases throughout the whole city; but by wise superintendence and control of the "social evil." A syphilitic person must not marry. When a man has contracted syphilis he ought to be treated methodically two years, and before he marries three years ought to elapse after the last symptoms of syphilis were noticed. During pregnancy in suspected wedlock, both man and woman ought to be treated.

TREATMENT. An infant with hereditary syphilis will not infect its own mother, and ought to be nursed. A healthy wet-nurse may be infected by the nursing, and when hired ought to be informed of possible danger. Careful artificial feeding will render the necessity of employing wet-nurses more and more superfluous, to a certain extent. The treatment of a syphilitic infant should be continued several years. After the symptoms have receded it may be interrupted and recommenced. Relapses are too frequent not to be considered as great dangers. Hydrargyrum does not affect the mouth and intestines of infants and children as it does those of adults. Calomel should be given many weeks in doses of a twelfth to an eighth of a grain three times a day. When anæmia is very urgent, iron may be given at the same time. If in rare cases there be a gastric or intestinal disorder, this is corrected by a few drops of camphorated tincture of opium administered from time to time. The green iodide of mercury is not so well tolerated as calomel, and the oxidulated tannate of mercury recommended by Lustgarten does not seem to offer any advantages. Hydrargyrum cum creta may be given in three daily doses of one-sixth to one-third grain each. No reliance ought to be placed on mercury given to the mother or nurse, for its elimination through the milk is an uncertain process and an unknown quantity. Inunctions of five or ten grains of blue ointment daily have been employed by many authors. If there be any (rare) contraindications to the internal administration of mercury, they are, however, quite welcome. But the skin of babies is very vulnerable. That is why, on no account, oleate of mercury should be used. Widerhofer modifies inunctions by applying a mercurial plaster of the size of a hand to the intrascapular region. In urgent cases, mainly those in which symptoms of syphilis are observed in the newly-born, corrosive sublimate should be used subcutaneously. To prevent occasional indurations the injections should be made into the muscular tissue, and the original solution of Lewin should be diluted. A solution of one part of corrosive sublimate and two of chloride of sodium in two hundred parts of water is well tolerated. From ten to fifteen drops may be injected daily. Condylomata heal under the external application of calomel. The nasal ulcerations do well with red precipitate ointment. The secondary stage of syphilis does not require iodides. Baths with corrosive sublimate (1 : 10,000) answer well in extensive cutaneous eruptions.

Syphilis tarda shows itself mostly in the bones. Iodide of potassium in three daily doses of from seven to fifteen grains each is well borne and effective. In iodism affecting the mucous membrane Rabl recommends the addition of atropin. I have mostly added potassic chlorate in doses, changing according to age (child of twelve years not more than half a drachm daily). When abdominal viscera or the nervous system are affected at the same time, blue ointment, fifteen to twenty-five grains daily, is to be rubbed in for five successive days with an interruption of two days afterward. Mineral baths containing iodine (St. Catherine's, Kreuznach) are very wholesome. When ill nutrition and anæmia are very marked, arsenic, or iron, or both, should be administered.

Sero-therapy in the shape of subcutaneous injections, in the prior stages of syphilis, of blood-serum taken from patients affected with tertiary syphilis, has been rather unsuccessful hitherto.

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